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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CONNELLY CUSHWA, MICHELLE R	
ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 05/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/620,479	JOHNSON ET AL.	
	Examiner	Art Unit	
	Michelle R. Connelly-Cushwa	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 March 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,63-65 and 73-90* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,63-65 and 73-90* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's Amendment filed March 21, 2005 has been fully considered and entered.

On page 7 of the Response filed March 21, 2005, Applicant indicated that a Terminal Disclaimer had been filed to obviate the double patenting rejection set forth in the prior Office action. Since there was no Terminal Disclaimer present in the file, Examiner Connelly-Cushwa contacted Mr. Chris C. Bowley of Fish & Richardson P.C., and he indicated that the Terminal Disclaimer was inadvertently omitted from the file. Examiner Connelly-Cushwa explained that the case was not currently in condition for allowance, so the Terminal Disclaimer could be filed at a later time. Therefore, the Double Patenting rejection has been maintained, but may be overcome by filing the Terminal Disclaimer in response to this Office action.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1 and 73-88 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 5-8, 13, 14, 16, 19, 21-29 and 42-45 of U.S. Patent No. 6,625,364 B2. Although the conflicting claims are not identical, they are not patentably distinct from each other because all of the limitations of claims 1 and 73-88 of the present application are at least disclosed or suggested in claims 1, 5-8, 13, 14, 16, 19, 21-29 and 42-45 of U.S. Patent No. 6,625,364 B2.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 74 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 74; the claim recites, "the ratio of the bandwidth of the first range of frequencies and the central frequency and is at least about 10%" in lines 1-2 of the claim. This limitation is indefinite because it is unclear if there is something missing after the second occurrence of "and" or if the second occurrence of "and" should be deleted.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 63-65 and 73-90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fink et al. (US 6,463,200 B2).

Regarding claims 1 and 84-88; Fink et al. discloses all of the limitations of these claims, except for specifically stating that the diameter of the core is in a range between 4λ and 80λ; 8λ and 80λ; 4λ and 60λ; 5λ and 60λ; 6λ and 40λ; or 8λ and 40λ.

In Figures 6A and 6B, Fink et al. discloses an optical waveguide (600) comprising a dielectric core region (602) extending along a waveguide axis; and a dielectric confinement region (multilayer film including layers 604, 606, 608, 610, 612, 614, 616) surrounding the core (602) about the waveguide axis, the confinement region comprising alternating layers of at least two different dielectric materials surrounding the core about the waveguide axis (see column 8, lines 25-28), wherein during operation the confinement region guides EM radiation in at least a first range of frequencies to propagate along the waveguide axis in the core; and wherein the core (602) has an average refractive index smaller than about 1.1 (see column 1, lines 62-67). Fink further discloses that the waveguide can be either multi-mode or single mode depending on the size of the inner core region (see column 7, lines 46-50). Optical fibers typically operate at a wavelength, λ, in the range of approximately 0.8 μm to 1.6 μm.

Typical values for the core diameter of a single-mode optical fiber are in the range of 5-10 μm and typical values for the core diameter of a multi-mode optical fiber

are in the range of 50-62.5 μm. One of ordinary skill in the art would have found it obvious to have the core diameter be either in the range of 5-10 μm or in the range of 50-62.5 μm for either single-mode or multi-mode operation, respectively, since Fink et al. indicates that the waveguide can be single-mode or multi-mode; these values are typical for optical fibers in the art; Fink et al. does not disclose a specific value and/or range for the diameter of the core; Fink et al. does suggest that the size of the core can be varied (see column 7, lines 46-50); and it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routing skill in the art. *In re Aller*, 105 USPQ 233. And, for operating wavelengths of 0.8-1.6 μm, diameters of 5-10 μm or 50-62.5 μm fall within the range of 4λ-80λ; 8λ-80λ; 4λ-60λ; 5λ-60λ; 6λ-40λ; or 8λ-40λ., where λ is a typical operating wavelength.

Regarding claims 63-65; Fink et al. discloses a waveguide (600) comprising:

- a dielectric core region (602) extending along a waveguide axis;
- a dielectric confinement region surrounding the core about the waveguide axis, the confinement region comprising alternating layers (604, 606, 608, 610, 612, 614, 616) of at least two different dielectric materials surrounding the core about the waveguide axis and guiding EM radiation in at least a first range of frequencies to propagate along the waveguide axis in the core;
- wherein the core has an average refractive index smaller than about 1.3 for a frequency in the first range of frequencies.

Fink further discloses that the waveguide can be either multi-mode or single mode depending on the size of the inner core region (see column 7, lines 46-50). Fink et al. does not specifically state that the diameter of the core is in a range between 5 and 170 microns, in a range between 7 and 100 microns, or in a range between 10 and 100 microns.

Typical values for the core diameter of a single-mode optical fiber are in the range of 5-10 μm and typical values for the core diameter of a multi-mode optical fiber are in the range of 50-62.5 μm. One of ordinary skill in the art would have found it obvious to have the core diameter be either in the range of 5-10 μm or in the range of 50-62.5 μm for either single-mode or multi-mode operation, respectively, since Fink et al. indicates that the waveguide can be single-mode or multi-mode; these values are typical for optical fibers in the art; Fink et al. does not disclose a specific value and/or range for the diameter of the core; Fink et al. does suggest that the size of the core can be varied (see column 7, lines 46-50); and it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routing skill in the art. *In re Aller*, 105 USPQ 233. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the diameter of the core be in a range of 5-10 μm or 50-62.5 μm, wherein such values are between 5 and 170 microns, between 7 and 100 microns, or between 10 and 100 microns.

Regarding claim 73; the waveguide supports a mode in which at least 99 percent of the average energy of the propagating EM radiation is in the core for a frequency in

the first range of frequencies (see column 1, lines 61-67; column 6, lines 31-36; and Figure 4).

Regarding claim 74; the ratio of the bandwidth of the first range of frequencies and the central frequency is at least about 10%.

Regarding claims 75 and 76; Fink et al. does not specifically state that the radiative losses are less than 1.0 dB/km or 0.1 dB/km for a frequency in the first range of frequencies. However, Fink et al. does disclose that the structure of the invention offers omni-directional reflectivity for a wide range of frequencies with low loss and that the method is presented for creating a very low loss broad band optical fiber (see column 7, lines 12-15 and line 23-24). Fink et al. also discloses that nearly 100% of the energy in the first range of frequencies propagates within the core (see Figure 4). Additionally, the waveguide disclosed by Fink et al. meets the structural limitations of the waveguide presently claimed. Therefore, the waveguide disclosed by Fink et al. is capable of propagating at least one mode along the waveguide axis with radiative losses less than 1.0 dB/km or 0.1 dB/km for a frequency in the first range of frequencies.

Regarding claim 77; the core may comprise a gas (air; see column 7, lines 31-33).

Regarding claim 78; the first range of frequencies may correspond to wavelengths in the range of about 1.2 microns to 1.7 microns (see Figure 4).

Regarding claim 79; the first range of frequencies may correspond to wavelengths in the range of about 0.7 microns to 0.9 microns (see Figure 4).

Regarding claims 80, 82 and 83; a lower-index one of the different dielectric materials comprises a polymer or glass (see column 8, lines 26-27), a higher-index one of the dielectric materials comprises germanium or tellurium (see column 8, lines 27-28); and the ratio of the refractive index of these two different dielectric materials in the dielectric confinement region is greater than 1.5.

Regarding claim 81; the dielectric confinement region is sufficient to cause EM radiation that is incident on the confinement region from the core in the first frequency range and with any polarization to have a reflectivity for a planar geometry that is greater than 95% for angles of incidence ranging from 0 to at least 180 degrees (see the abstract).

Regarding claim 89; Fink et al. discloses a waveguide (600) comprising:

- a dielectric core region (602) extending along a waveguide axis; and
- a dielectric confinement region (604, 606, 608, 610, 612, 614, 616) surrounding the core about the waveguide axis, the confinement region comprising alternating layers of at least two different dielectric materials surrounding the core about the waveguide axis;
- wherein the core comprising a gas (air) and has an average refractive index smaller than about 1.3 for a frequency in the first range of frequencies;
- wherein λ is a wavelength corresponding to a central frequency in the first frequency range; and

- wherein a lower-index one of the different dielectric materials comprises a polymer or glass (see column 8, lines 26-27), a higher-index one of the dielectric materials comprises germanium or tellurium (see column 8, lines 27-28); and the ratio of the refractive index of these two different dielectric materials in the dielectric confinement region is greater than 1.5.

Fink et al. does not specifically state that the radiative losses are less than 1.0 dB/km for a frequency in the first range of frequencies. However, Fink et al. does disclose that the structure of the invention offers omni-directional reflectivity for a wide range of frequencies with low loss and that the method is presented for creating a very low loss broad band optical fiber (see column 7, lines 12-15 and line 23-24). Fink et al. also discloses that nearly 100% of the energy in the first range of frequencies propagates within the core (see Figure 4). Additionally, the waveguide disclosed by Fink et al. meets the structural limitations of the waveguide presently claimed. Therefore, the waveguide disclosed by Fink et al. is capable of propagating at least one mode along the waveguide axis with radiative losses less than 1.0 dB/km for a frequency in the first range of frequencies.

Fink further discloses that the waveguide can be either multi-mode or single mode depending on the size of the inner core region (see column 7, lines 46-50). Fink et al. does not specifically state that the diameter of the core is in a range between 4λ and 80λ. Optical fibers typically operate at a wavelength, λ, in the range of approximately 0.8 μm to 1.6 μm.

Typical values for the core diameter of a single-mode optical fiber are in the range of 5-10 μm and typical values for the core diameter of a multi-mode optical fiber are in the range of 50-62.5 μm. One of ordinary skill in the art would have found it obvious to have the core diameter be either in the range of 5-10 μm or in the range of 50-62.5 μm for either single-mode or multi-mode operation, respectively, since Fink et al. indicates that the waveguide can be single-mode or multi-mode; these values are typical for optical fibers in the art; Fink et al. does not disclose a specific value and/or range for the diameter of the core; Fink et al. does suggest that the size of the core can be varied (see column 7, lines 46-50); and it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routing skill in the art. *In re Aller*, 105 USPQ 233. And, for operating wavelengths of 0.8-1.6 μm, diameters of 5-10 μm or 50-62.5 μm fall within the range of 4λ-80λ, where λ is a typical operating wavelength.

Regarding claim 90; the core may comprise a gas (air; see column 7, lines 31-33); a lower-index one of the different dielectric materials comprises a polymer or glass (see column 8, lines 26-27), a higher-index one of the dielectric materials comprises germanium or tellurium (see column 8, lines 27-28); and the ratio of the refractive index of these two different dielectric materials in the dielectric confinement region is greater than 1.5.

Fink et al. does not specifically state that the radiative losses are less than 1.0 dB/km for a frequency in the first range of frequencies. However, Fink et al. does disclose that the structure of the invention offers omni-directional reflectivity for a wide

range of frequencies with low loss and that the method is presented for creating a very low loss broad band optical fiber (see column 7, lines 12-15 and line 23-24). Fink et al. also discloses that nearly 100% of the energy in the first range of frequencies propagates within the core (see Figure 4). Additionally, the waveguide disclosed by Fink et al. meets the structural limitations of the waveguide presently claimed. Therefore, the waveguide disclosed by Fink et al. is capable of propagating at least one mode along the waveguide axis with radiative losses less than 1.0 dB/km for a frequency in the first range of frequencies.

Response to Arguments

Applicant's arguments filed March 21, 2005 have been fully considered but they are not persuasive.

Regarding prior art rejections to claims 1 and 63-65 over Kawanishi (JP 2000-35521 A); the rejections are withdrawn in view of Applicant's amendments to the claims.

Regarding prior art rejections to claims 1 and 63-65 over Fink et al. (US 6,463,200 B2); Applicant states that each of these claims recites a particular range for the diameter of the core and that the action concedes that Fink does not disclose such ranges, but indicates that selecting such ranges would be obvious to one of ordinary skill in the art. Applicant disagrees. Applicant states that "obvious to try" is an improper rationale.

The rejection, however, does not rely on the rationale that one of ordinary skill in the art would have found it "obvious to try" such ranges. In contrast, one of ordinary skill in the art would have found it obvious to try ranges that are conventionally used for

single-mode or multi-mode operation, since Fink et al. specifically states that the waveguide can support radiation that is single mode or multi-mode depending on the size of the core (see column 7, lines 46-50). And, typical values for the core diameter of a single-mode optical fiber are in the range of 5-10 μm and typical values for the core diameter of a multi-mode optical fiber are in the range of 50-62.5 μm, wherein values in each of these ranges falls within Applicant's particular claimed range. For reference only to the fact that such ranges are typical for single-mode or multi-mode fibers, Applicant is directed to column 3, lines 16-25 of U.S. Patent No. 6,453,097; column 1, lines 44-47 of U.S. Patent No. 6,874,950; column 1, lines 24-26 of U.S. Patent No. 6,487,359; and column 1, lines 26-29 of U.S. Patent No. 6,895,132. Each of these patents reference the well known core diameters typically used for single-mode or multi-mode optical fibers. Therefore, one of ordinary skill in the art would have found it obvious to use core diameters within the known established ranges that support either single-mode or multi-mode operation.

Applicant states that the invention is directed to a complex set of design parameters for a waveguide and that the claims set forth specific criteria for the waveguide including core radius and additional features including the core refractive index, the alternating layer structure of the confinement region and the refractive index of the alternating layers.

Fink et al. discloses the core refractive index, the alternating layer structure of the confinement region and the refractive index of the alternating layers as defined in the claims of the present application. Furthermore, Fink et al. teaches that the waveguide

may be either single-mode or multi-ode depending on the size of the inner core region. Known ranges for the core size for single-mode or multi-mode operation have been established and are known to one of ordinary skill in the art. Given the suggestion of Fink et al. to form either a single-mode or multi-mode waveguide by varying the size of the core, one of ordinary skill in the art would have found it obvious to do so by making the core a size that falls within the established ranges for single-mode or multi-mode operation in the art. Values within these established ranges fall within the range of values set forth in the claims of the present application for the size of the core.

Applicants further state that the present specification teaches the significance of such design criteria, including the determination that the fraction of energy outside the core for a guided mode in a photonic crystal fiber scales inversely with the cube of the core and, accordingly, radiation and dissipation losses associated with the dielectric confinement layers can be made very small by increasing the core radius; that although the large core leads to multiple guided modes, the multiple modes have attenuation losses that differ significantly from one another and the differential losses among the multiple modes rapidly lead to single-mode operation for modest transmission lengths, avoiding modal dispersion; and that there is an upper limit on the core size, because when the core size is too large, larger than about forty times the wavelength of the guided radiation, the modes become closely spaced, and, perturbations more easily cause coupling between different modes.

First, Fink et al. discloses and/or suggests all of the *claimed limitations* as discussed above with respect to the claims. Second, In response to applicant's

argument that the present specification teaches the significance of the design criteria, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). Fink et al. discloses and/or suggests all of the claimed design criteria. Therefore, additional advantages of the structure defined and/or suggested by Fink et al., as discussed above with respect to the claims, can not be the basis for patentability. The additional advantages must result in additional or different structural limitations that must be set forth in the claims in order to distinguish over the prior art. Furthermore, since the waveguide disclosed by Fink et al. has the same structure (i.e. the core index of refraction, the alternating layer structure of the confinement region and the refractive index of the alternating layers), the waveguide of Fink et al. has the same advantages as the waveguide of the present application, including low loss and avoidance of modal dispersion. Examiner notes that the claimed ranges for core size exceed forty times the wavelength of the guided radiation.

Applicant further states that Fink provides no indication as to how the core radius parameter is relevant and no direction as to how to optimally select the core radius parameter. Examiner disagrees. Fink et al. clearly suggests that the size of the core determines whether the waveguide will be single-mode or multi-mode. Thus, one of ordinary skill in the art would have found it obvious to select the core size based on the desired mode of operation of the waveguide. There are established ranges of core sizes in the art for both single-mode and multi-mode propagation, and one of ordinary

skill in the art would have been familiar with these known ranges and would have found it obvious to make the core of the waveguide of Fink et al. be a size within a known range of sizes to establish either single-mode or multi-mode operation as suggested by Fink et al.

Applicant states that Fink fails to appreciate the significance of the core radius parameter because he erroneously concludes that a waveguide having a large core radius is limited to multi-mode operation, while applicants have discovered that the range of larger core radii specifically claimed can provide both reduced radiation and dissipation losses, and where desired, effective single-mode operation. The claims of the present application, however, are not limited to a range of larger core radii that effect single-mode operation, and Fink et al. does disclose that the waveguide has very low loss.

Applicant further states that Fink gives no indication of how the core radius is critical or any direction as to how to select such parameters to be those claimed. Fink et al., however, discloses and/or suggests all of the claimed design criteria as discussed above.

Applicant further states that the action's reliance on *In re Aller* and *In re Boesch* are misplaced; that application of *In re Aller* requires that "the general conditions of a claim are disclosed in the prior art" before the claimed invention can be considered obvious as "routine experimentation"; that Fink fails to provide such general conditions, specifically indicating that the core radius may be anywhere from "very small" to "large" and not indicating the range claimed for the transverse extent of the confinement range;

that a particular parameter must first be recognized as a results-effective variable before the determination of the optimum or workable range of the variable might be characterized as routine experimentation; that Fink fails to appreciate how the core radius parameter is a results-effective variable; that Fink fails to appreciate that increasing the core radius can decrease radiation and absorption losses; and that Fink erroneously concludes that a waveguide with a large core radius is limited to single mode operation.

The general conditions of the claimed invention (i.e. the index of refraction of the core, the layered structure of the confinement region, and the index of refraction of the layered structure) are disclosed by Fink et al. as discussed above with respect to the claims. Fink et al. further indicates that the core size may be varied and that varying the core size determines whether the waveguide is a single-mode or a multi-mode waveguide. Therefore, Fink et al. recognizes that varying the core size from small to large results in changing from single-mode to multi-mode propagation in the waveguide. Thus, Fink et al. recognizes that the core size is a results-effective variable and suggests that the size be selected based on the desire for either single-mode or multi-mode propagation. Thus, one of ordinary skill in the art would have found it obvious to select the core size to achieve either single-mode or multi-mode operation, as specifically taught by Fink et al., and would further have found it obvious to make size of the core fall within known ranges for core size to achieve either single-mode or multi-mode radiation, wherein values within these known ranges fall within the claimed ranges of the present application. Furthermore, the waveguide disclosed by Fink et al.

is a very low loss waveguide as discussed by Fink et al., and Applicant has not limited the claims of the present application to an embodiment in which a large core radius is limited to single mode operation. Thus, the action's reliance on *In re Aller* is proper. The Examiner notes that the claims have been amended to omit limitations directed to the transverse extent of the confinement range, and, therefore, any arguments directed to such limitations are moot.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (571) 272-2345. The examiner can normally be reached 9:00 AM to 7:00 PM, Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.

Michelle R. Connelly-Cushwa

Michelle R. Connelly-Cushwa
Patent Examiner
May 24, 2005